REPORT N.7

Incorporating ESG into the oil and gas industry

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ABSTRACT

The rising pressure coming from governments' and supranational entities' policies, increasing regulation, and investors' requests is nowadays forcing oil and gas companies to take all the necessary means to mitigate their environmental impact and increase transparency. Global investors are increasingly conscious of environmental issues. Oil and gas companies are more and more pressured to disclose consistent, comparable, and reliable data, while activist shareholders are challenging US and Europe-based oil major firms on their climate policies and emissions-reduction plans. In the five markets examined by the Global Sustainable Investment Alliance (Australia and New Zealand, Canada, Europe, Japan, and the United States) sustainable investments reached assets of $30.7 trillion in early 2018, one-third of total investment. To satisfy the ESG standards, every company must develop sustainable environmental and governance practices, but they take on great and increasing importance in the oil and gas sector. Environmental risks can be divided into four major categories: Energy efficiency, Air emissions, Water management, Waste management. In order to address stakeholders' expectations about sustainable development, companies belonging to the oil and gas industry should develop structural strategies to guide their future actions.

The recommended approach should be holistic and should try to achieve the highest financial impact at the minimum cost and effort. From an asset management point of view, listed renewable power portfolios have outperformed listed fossil fuel portfolios in all geographies considered (Germany, France, UK, USA). During periods of high market and oil price volatility, Fossil Fuel portfolios experienced larger drawdowns than Renewable Power portfolios. Renewable Power Portfolios performance has significantly improved over the last five years and their volatility has decreased.

The energy sector is accountable for a great deal of human-made GHG emissions, representing a high risk for society. Although the economic slowdown caused by the Covid-19 outbreak has contributed in decreasing energy emissions, only structural changes in the O&G industry operations can bring about significant and permanent cuts.

From now onwards, with the aid of the most recent technologies, O&G companies shall adopt holistic strategies to increase their level of transparency and accountability, decrease their environmental footprint, and minimize costs to improve their financial margins.

SUMMARY

INTRODUCTION

The rising pressure coming from governments and supranational entities' policies, increasing regulation, and investors' requests is nowadays forcing oil and gas companies to take all the necessary means to mitigate their environmental impact and increase transparency.

The accelerating energy transition puts the future of these companies at stake, amplifying the already incumbent uncertainty for this industry.

The effort that oil and gas companies have to make, must be read not only in terms of environmental scope, but also considering the other two pillars of ESG strategies: social and governance fronts. Therefore, a comprehensive approach needs to be adopted, not only focusing on controlling CO2 emissions, but also on bridging the gender gap and maintaining the diversity, wellbeing, and safety of employees.

This report aims to give an outlook on the oil and gas industry by framing it in the scenery of emerging trends with regard to energy transition and ESG investment strategies.

After giving an overview of the recent facts that affected the industry and some relevant data, we will highlight the risks that are to be faced and we will illustrate the means to survive in a fast-changing environment.

OVERVIEW OF THE OIL AND GAS INDUSTRY

There is general agreement regarding the emissions generated by the combustion of fossil fuels and the differences between them. One unit of energy produced from natural gas generates 40% less CO2 emissions than from coal, and 20% less compared to oil. The oil and gas industry alone accounts for 9% of all human-made greenhouse gas (GHG) emissions. In addition, it produces fuels that generate another 33% of global emissions.

The World Energy Outlook provides detailed analysis regarding indirect emissions produced along the OIL AND GAS value chain, across the stages of production, processing, and transporting. Those coming from oil are estimated to be between 10% and 30% of its full lifecycle emissions totality, while those coming from natural gas between 15% and 40%. Today, oil and gas operations produce indirect GHG emissions amounting to around 5,200 million tons (Mt) of CO2 equivalent. Methane emissions constitute the largest share of this category, but it remains still particularly challenging to accurately measure them.

Over the past few years, there has been a change in the way in which investors see Oil and gas companies, making value count more than volume, thus drastically interrupting the "obsessive" growth of the energy sector. As shown in Figure 1, by the end of 2019 the S&P Energy Sector index underperforms the S&P 500. Oil and Gas companies operate in a "traditional" industry, so they underperformed and are likely to underperform in the future with respect to other sectors. This aspect will be shown in the Key Financial Factors paragraph, also explaining that companies in the Energy sector that use renewable energy overperform their peers.

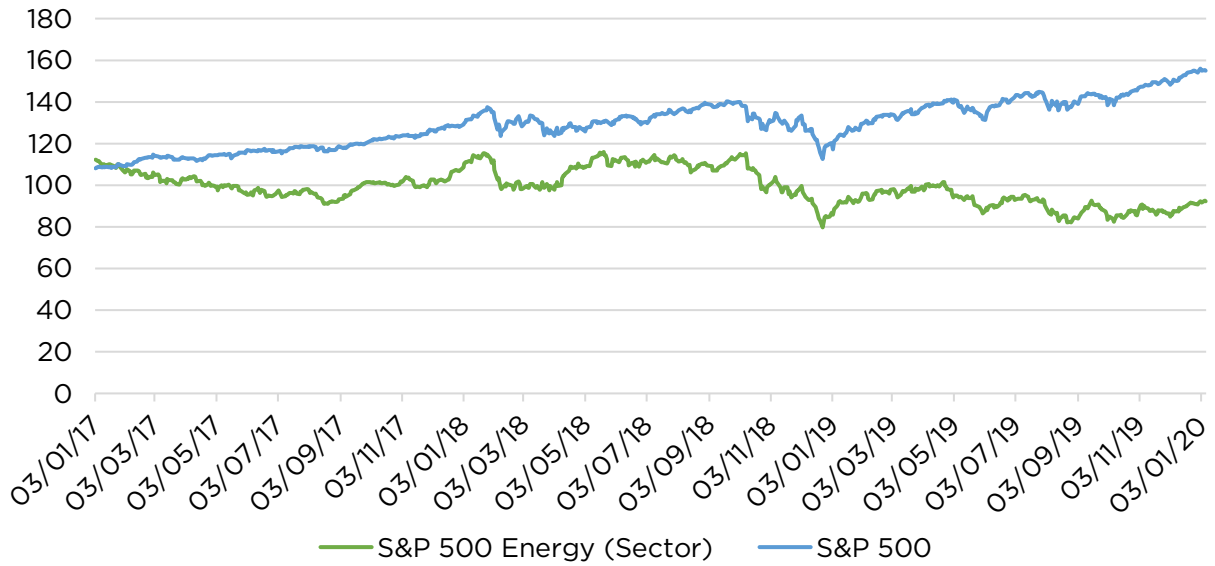


Figure 1 - S&P 500 Energy vs. S&P 500 Performance Comparison (2017-2019).
Source: Dow Jones Sustainability World Index - Factsheet, 2020.

The energy sector was expecting the demand for oil to increase in 2020, which did not happen due to the breakout of Covid-19. In fact, the exact opposite occurred: a collapsed oil demand combined with an excessive supply. Oil prices started to turn over at the beginning of the year and then went into free fall, dropping from the low $60s in early January to the low $20s by the end of March. Overall, the World Energy Outlook estimates 2020 energy demand to be 5% lower than last year. Since coal and oil - the most carbon-intensive fuels - are bearing most of the demand decline, the sector's emissions are expected to fall by approximately 7%. The 2.4 gigatons (Gt) decline caused by the Covid-19 pandemic hence takes annual CO2 emissions back to where they were a decade ago.

Global emissions are projected to bounce back more slowly than after the 2008 financial crisis, but a sustainable recovery is still a far utopia. An economic recession may lower emissions, but it also kills the impetus for the transition process in the energy sector. Lower fuel prices, compared with pre-crisis trajectories, mean that payback periods for efficiency investments are extended, slowing the rate of global efficiency improvement. Only an acceleration in structural changes to the way the world produces and consumes energy can break the emissions trend for good.

Global investors are increasingly conscious of environmental issues. Oil and gas companies are more and more pressured to disclose consistent, comparable, and reliable data, while activist shareholders are challenging US- and Europe-based oil majors on their climate policies and emissions-reduction plans. In the five markets examined by the Global Sustainable Investment Alliance (Australia and New Zealand, Canada, Europe, Japan, and the United States) sustainable investments reached assets of $30.7 trillion in early 2018, one-third of total investment. At September's UN climate summit, an alliance of the world's largest pension funds and insurers (representing $2.4 trillion in assets) committed itself to transition its portfolios to net-zero emissions by 2050.

At the same time, renewable technologies are getting cheaper. In the US, the cost of solar has decreased by more than 70% since 2011, while the cost of wind by almost two-thirds. By 2025, they could be competitive with natural gas-based power generation in many more regions. Other forces are also coming into play: although there is still no global market, according to the World Bank, carbon taxes or trading systems cover 20% of worldwide emissions, compared with 15% in 2017.

Many European governments plan to implement binding GHG emissions targets and are drawing up national energy and climate plans.

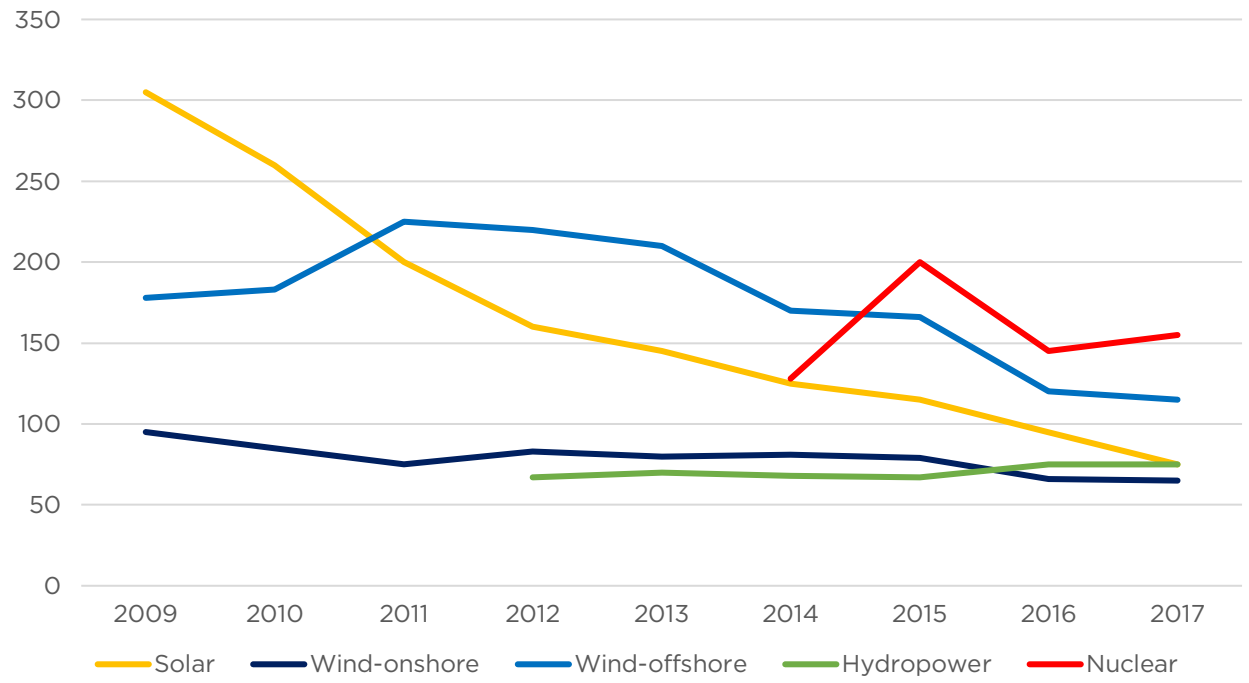


Figure 2 - Levelized cost of electricity - US dollars per megawatt hour.
Source: IMF, Bloomberg New Energy Finance, Federal Reserve Economic Data.

ENVIRONMENTAL SOCIAL GOVERNANCE RISKS

To satisfy the ESG standards, every company must develop sustainable environmental and governance practices, but they take on great and increasing importance in the oil and gas sector.

Environmental risks can be divided into four major categories:

1. Energy efficiency
2. Air emissions
3. Water management
4. Waste management

Companies should always consider energy efficiency measures as this could have a substantial positive impact on their revenues by increasing the net energy conversation ratio.

$$\frac{energy\ output\ per\ unit\ of\ energy}{fuel\ input}$$

Moreover, air emissions regulations are generally becoming more stringent globally. Air emissions come from exhaust gases from power generation or water injection, the flaring and venting of gas, and fugitive emissions. Continuous venting of associated gas is not considered good practice and should be avoided.

For what concerns water management, oil and gas extraction plants may require cooling water for their operations. The heated water is normally discharged back to the source body (i.e. river, lake, estuary, or the ocean). In these cases, a detailed assessment of the impacts associated with discharge should be conducted as this may generate major impacts on the receptor (e.g. river, ocean). Water is also used in testing for pipeline and equipment leaks. Chemical additives are also often used to prevent corrosion or assist in leak identification. Due care should be taken in the disposal of test water to prevent pollution of underground or surface water sources. Another wastewater arising in the industry comes from sewerage plants, drainage waters, tank bottom water, fire water, and equipment cleaning, all of which are likely to contain oily residues.

Eventually, for what concern waste management, where even relatively small volumes of potentially hazardous wastes are generated (e.g. process wastes described above or used machinery oils, lubricants, solvents, paints or cleaners and their containers) the company must ensure that these are stored, handled,

transported and disposed of in accordance with GIIP, to prevent environmental contamination or danger to handling workers or communities nearby.

Special consideration should be given to water and waste management in offshore oil and gas development. Offshore oil and gas extraction facilities also require cooling water for their operations. The heated water is normally discharged back to sea, but careful consideration should be given to disposal depth and the use of anti-fouling chemicals to minimize negative marine environment impacts. Solid waste streams specific to offshore oil and gas developments include drilling fluids and drilled cuttings (containing additives for weight and thickening), produced sand (generally contaminated with hydrocarbons), completion and well workover fluids (including chemical additives as well as oils or solid materials) and naturally occurring radioactive materials (NORM) which may occur as sludges in process piping or production vessels. Most wastes should be shipped to shore for treatment. Another source of specific concern regards air emission in storage and distribution of oil e gas: Emissions come from volatile organic compounds (VOCs) in storage through evaporation, from leakage, or during operational activities. The natures of emissions arising from distribution depend on the transport means and include emissions from road, rail, or shipping tankers.

Fund managers should be mindful of this trend when designing, financing and operating oil and gas extraction facilities and they should encourage companies to explore business opportunities associated with the use of cleaner technology/energy efficiency measures (e.g. selling carbon emission reduction credits and/or accessing grants from international climate change funds).

To satisfy ESG standards, every company has to develop sustainable governance practices. They acquire great importance in the oil and gas sector because it presents a great number of potential risks for society. In a certain sense, social risk and good governance practices are the two sides of the same coin: an activity that presents social risks also requires good governance practices to avoid or mitigate them. Besides, the way a company in this sector is perceived by investors, governments, and local communities can vary significantly depending on how it fulfills the governance ESG standards, trying to balance between its profits and the ones of the community where it operates.

The first principle, which should guide a company in choosing which are the right governance practices to adopt, is to evaluate the risk of its operation for the community and its workers, trying to completely avoid them. If this is not possible the

company should try to reduce them, then to mitigate and, only as of the last choice, to offset with compensations.

A company that operates clearly, adopting sustainable practices will more likely avoid fines, the possibility of losing the license to operate, and conflicts with local communities, which means costs, as they can cause interruptions of the company's activities. Besides, a positive relationship with local communities can lead to increased production through access to a better or bigger potential labor pool. A positive attitude of the government towards the company is an additional benefit arising from the adoption of ESG practices, even if it might be the case that it turns a blind eye to some negative behaviors due to the high interest related to this kind of activities. Companies must, even in this case, avoid poor governance practices. In addition, companies should avoid the use of third-party partners to cover their unethical behaviors, giving them the fault for things that could damage the company image.

Another risk to take into consideration in managing this kind of activities is the risk of theft (can cause significant spills/discharges), sabotage and terrorism, which can require the hiring of security staff. In this case, also security risks for local communities, if the company security and protection forces use excessive force or are intimidating and aggressive, should be considered. A company has also to be aware of the possible problems arising from the process of acquisition of the land necessary for its activities. It might be the case that lands are exploited, with no rights, by local communities which are linked to them by custom and traditions as, for example, sacred sites and areas of importance for recreation and aesthetic enjoyment. This might make the company's acquisition of land more difficult.

In conclusion, also the indirect effects of the company's activities should be considered. If the extraction of oil and gas is placed in remote locations, it might constitute a threat to the biodiversity of the area, putting at risk its natural resources. Therefore, the possible competition for resources, arising among the company and the inhabitants of that region is another aspect to take into consideration.

STRATEGIES AND OPERATIONS TO MEET ESG GOALS

In order to address stakeholders' expectations about sustainable development, companies belonging to the oil and gas industry should develop structural strategies to guide their future actions.

The recommended approach should be holistic and should try to achieve the highest financial impact at the minimum cost and effort.

In order to reach such a result, some valuable steps can be considered and tailored to each company:

- Goals: understanding the baseline for setting medium- and long-term targets;
- Initiatives: looking for the most cost-effective way to decarbonize different sources of emissions and how to manage trade-offs between long-term decarbonization and revenues;
- Management: individualize the needed capabilities and decide how to allocate capital for decarbonization across the whole portfolio;
- Stakeholder strategies: understanding how to get different typologies of stakeholders (investors, customers, employees, social community, etc.) to support the intended decarbonization plan;
- Energy transition: find a way to align decarbonization goals with the needed energy transition.

Furthermore, the whole strategy must be accompanied by a high level of transparency and measurement approaches. For instance, to fulfill the lack of clear comparability standards in the industry, the market is moving towards the introduction of recognized certification that evaluate emissions across all stages of exploration and production, as Intertek will do with the launch of Carbon Clear. Those kinds of certifications, willing to become the base for established international standards, may represent a grate incentive for investors: during a survey proposed to a relevant group of industry's investors, 90% of them confirmed that were willing to see oil and gas players adopt such certifications.

Moreover, to cover an active role in mitigating the climate change, the oil and gas industry should cut 90% of its actual emissions by 2050. However, while is true that the effort requested to the sector is meaningful, there are several viable interventions to that could even result cost-effective.

In particular, as showed in the table below, most of them relates to both:

- upstream operators: those involved in exploration, drilling and extraction activities - that today account for two-thirds of sector-specific emissions;

- **downstream operators**: those involved in converting oil and gas into finished products, such as oil refineries or petroleum product distributors.

To conclude, here there are some viable solutions that would help O&G companies to profitably meet many of the ESG goals, according to the typology of operations carried out:

Upstream operators	Downstream operators
Turning power source to renewable power generation, companies have proved to reach cost-cutting alternatives to diesel fuels; **Reducing fugitive emissions** through a more systematic strategy of plants maintenance, companies can relevantly cut methane emissions; **Electrifying equipment**, for instance replacing gas boiler with electric steam-production systems; **Reducing non routine flaring** (a usual result of poor reliability) though a predictive maintenance and replacing of equipment can reduce emissions and raise production.	**Reach energy efficiency** through specific downstream technologies, such as waste-heat-recovery and medium-temperature technologies, which would both reduce the amount of primary energy used and possibly save plant expenses; **Adopt greener feedstocks** replacing oil ones with recycled-plastic materials or biobased ones, which would relevantly cut emissions.

FINANCIAL PERFORMANCES

From a purely financial point of view, the primary question for investors is whether fossil fuels or renewables offer better risk-adjusted returns into the future.
While there are many ways to address this question, a common starting point is the evidence offered by recent history.

US Market

During the last 10 years the Renewable Power portfolio generated higher returns and higher volatility than the Fossil Fuel portfolio. There are several underlying fundamentals observed in the US market:

- A downturn in oil prices from 2014 that resulted in a period of lower returns on invested capital and dramatic cost-cutting by oil and gas companies. The US shale sector was hit particularly hard (bankruptcies and persistently negative FCF).
- A run-up in capital expenditures by oil and gas companies in the first half of the decade was followed by a 75% decline in the years 2014-16.
- Steep consistent reductions in technology costs, federal tax credits.
- More ambitious renewable portfolio standards and clean energy standards adopted by several states have provided better long-term visibility for the sector.

In particular, two key factors emerged in the last 5 years:

- A fall-off in oil prices and stronger investment in renewable power helped the Renewable Power portfolios to deliver higher returns with less risk than the Fossil Fuel portfolio. This trend is particularly clear from 2016 onwards, with significant appreciation for the US renewable segment relative to other segments and industries.
- From the end of 2018, the price appreciation further accelerated, with growth steepening again from mid-2019 onwards.

5 years	Total return	97.2%	192.3%
	AAR	7.0%	11.1%
	Annualized volatility	25.4%	28.6%
10 years	Total return	-9.6%	65.6%
	AAR	-2.9%	10.1%
	Annualized volatility	28.3%	26.7%

Table 1 - Return and volatility over the last 10 years and 5 years.

Graph 1 – Total return comparison for the US.

Analysis over January - April 2020: the impact of Covid-19

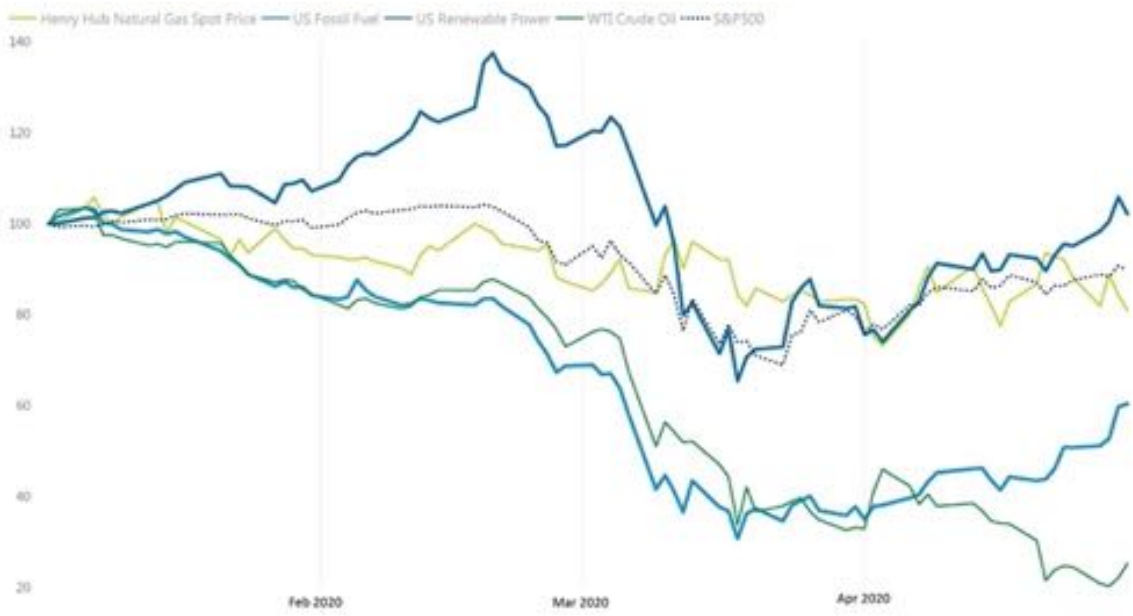
The Renewable Power portfolio has held up better than the Fossil Fuel portfolio (higher returns with less volatility), and even showed a higher level of return than the S&P 500.

It is well worth noting that the fossil fuel portfolio has posted the worst daily returns and highest volatility, second to only the oil price itself.

Which are the main reasons behind these performances?

- The revenue buffet from solar PV and wind projects mitigated the shock.
- The Renewable power sector has displayed higher volatility than the market benchmark: this may reflect the influence of companies involved in equipment manufacturing, where near-term supply chain uncertainties have grown.
- The unprecedented drop in oil demand and unprecedented losses for the fossil fuel industry. The IEA forecasts that global oil demand is expected to fall by a record 8.6 mb/d year-on-year in 2020 and the recovery to be gradual.

The most recent shock highlights the importance of risk management and portfolio diversification. To which exact degree renewable power provides such diversification to investors?



Graph 2 – US Fossil Fuel vs. Renewable Power Total Return Comparison, January - April 2020

UK Market

Even on the other shore of the Atlantic Ocean, the renewable Power Portfolio showed higher average annual return and half the volatility compared to the Fossil Fuel portfolio.

It emerges just a short period of decline between 2015 and 2016 of the Renewable Power Portfolio. The appreciation of the UK Renewable Power portfolio from 2016 onwards, it is due in part to the introduction of the renewables auction scheme in 2015, which provides long-term pricing for renewables projects under contracts, and has helped spur the development of the world' largest offshore wind market.

5 years	Total return	7,1%	N/A
	AAR	0,7%	N/A
	Annualized volatility	23,0%	N/A
10 years	Total return	8,8%	75,4%
	AAR	0,2%	11,1%
	Annualized volatility	25,6%	10,6%

Table 2 - Return and volatility over the last 10 years and 5 years.

Graph 3 – Total Return Profile for the UK

FR - GER Market

To the same degree, in the German and French markets, the renewable power portfolio registered higher returns and lower volatility over both the ten- year and the five-year periods: compared to the 10-year total return of -25% for the Fossil Fuel portfolio, the Renewable Power portfolio exhibits a return of 171%.

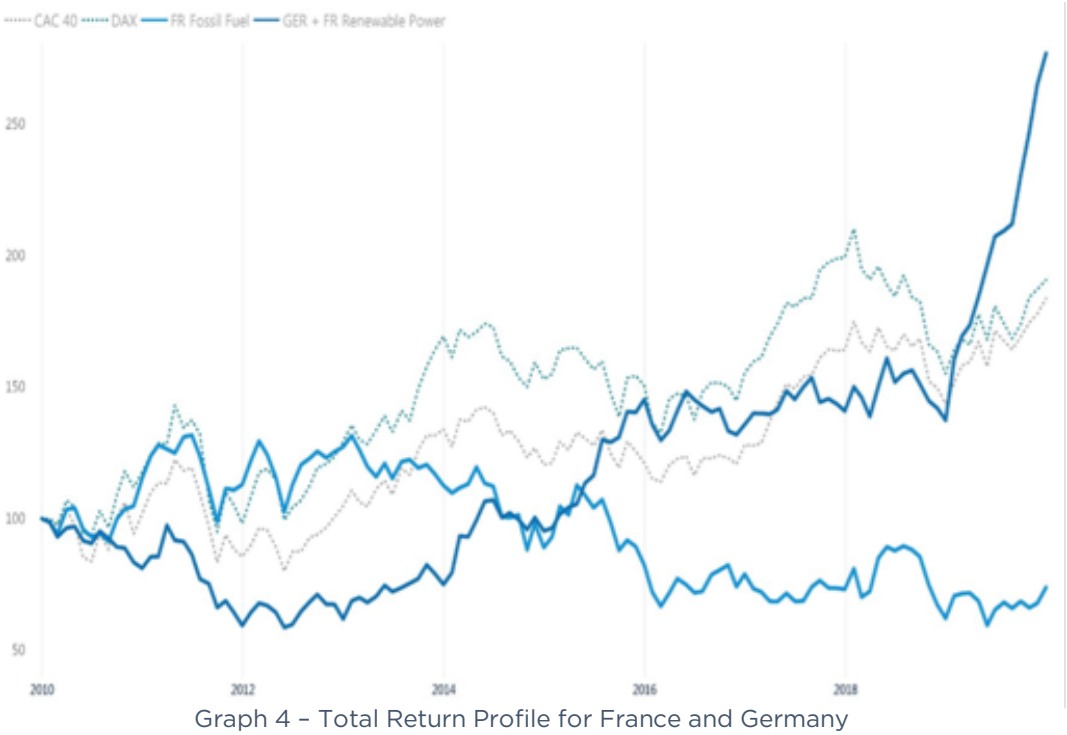
Specifically, the renewable power portfolio is driven by German stocks known to be representative of the Energiewende, i.e. the ongoing transition by Germany to a low carbon, environmentally sound, reliable energy supply.

There are some key elements behind those data that need to be underlined:

- The long - term policy support has underpinned a steady appreciation of shares since 2012
- Uncertainties regarding auction schemes and the presence of persistent project-level risks for solar PV and wind (e.g. related to permitting, grid integration), have weighed on performance at times
- The surge starting towards the end of 2018 coincides with the publishing of the long-term European Union target of 32% renewable energy in final energy consumption by 2030 and the IPO of pure-play renewable developer Neoen.

5 years	Total return	-25,1%	171,1%
	AAR	-3,0%	10,3%
	Annualized volatility	22,8%	17,7%
10 years	Total return	-20,7%	178,2%
	AAR	-3,7%	23,0%
	Annualized volatility	24,7%	15,0%

Table 3 - Return and volatility over the last 10 years and 5 years.



Graph 4 – Total Return Profile for France and Germany

TAKEAWAYS

Listed Renewable Power portfolios have outperformed listed Fossil Fuel portfolios in all geographies considered.

During periods of high market and oil price volatility, Fossil Fuel portfolios experienced larger drawdowns than Renewable Power portfolios.

Renewable Power Portfolios performance has significantly improved over the last five years and their volatility has decreased.

Annualized volatility for the Renewable Power portfolios was similar, or lower, than the Fossil Fuel portfolios.

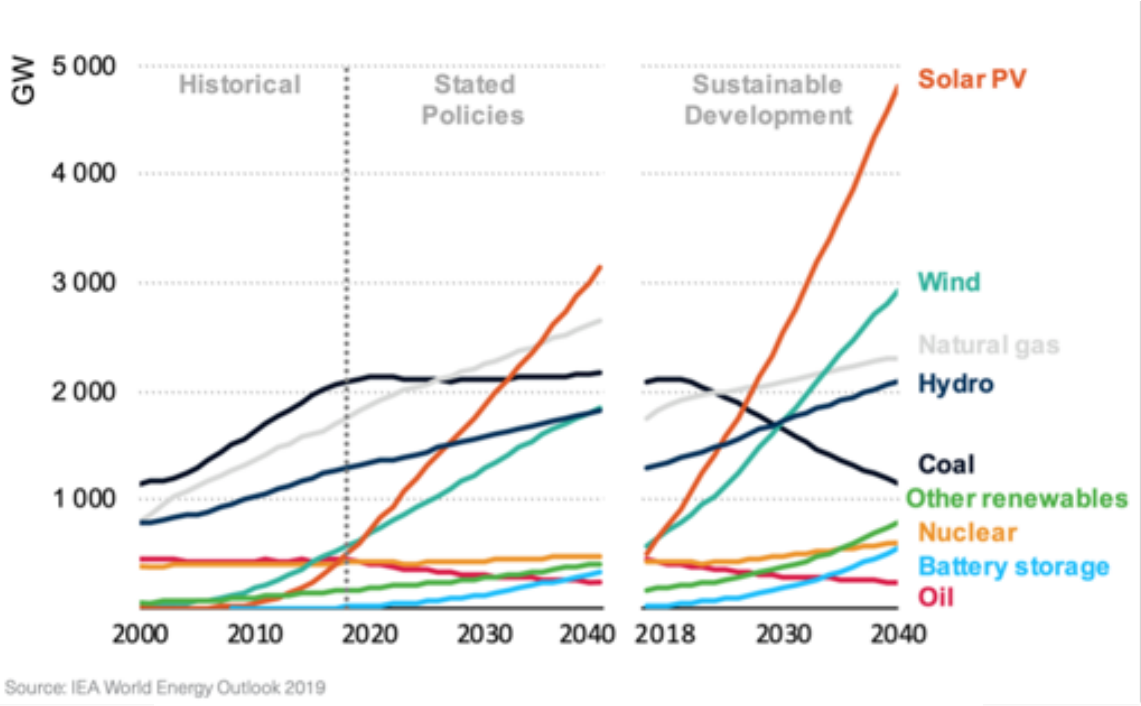
The appreciation in renewable power share prices observed over the past decade, alongside an acceleration of observed flows to debt instruments like green bonds, demonstrates clear investor interest.

However, we would like to point out that, like all investment analysis, historical performance provides no guarantee of a structural advantage going forward, especially if we keep in mind the current uncertainties and the speed of conversion in the international energy system.

LOOKING AHEAD

Future developments and policies

It has already been highlighted how important policies are in the energy sector. In particular, it is well worth noting the quantitatively tangible impact that political orientations and long-term visions can have on the energy sources, as illustrated by the graph below. Let's see how the countries subject to our analysis are shifting towards renewable energy.



Graph 5 – Global power generation capacity by source and scenario

USA

Joe Biden wants American electricity decarbonized by 2035.

There is more running room for gas to effectively take market share from coal and reduce emissions in the mid-term, because renewables aren't cost effective everywhere.

Until battery storage technology evolves to the place where it is possible to effectively store that renewable power, natural gas seems to be the most prudent lowest emission fuel for us to use going forward.

More than 100 oil and gas companies in North America have filed for bankruptcy this year, as the price crash continues to course through the sector. Therefore, it seems that the worst is not completely behind the fossil fuel companies.

UK

The green industrial revolution announced by the prime minister Boris Johnson, mostly consists in the development of 40GW of offshore wind power, with the goal of making the country "the Saudi Arabia of wind".

It scopes out investment in hydrogen, new nuclear reactors, insulation for buildings, and includes the obligatory promise to develop carbon capture and storage.

EU

The European Green Deal is a set of policy initiatives by the European Commission with the overarching aim of making Europe climate neutral in 2050. For the European Union to reach its ambitious target of climate neutrality, one goal is to decarbonize its energy system by aiming to achieve "net-zero greenhouse gas emissions by 2050." The key principles include:

- to "prioritize energy efficiency"
- to "develop a power sector based largely on renewable resources"
- to secure an affordable EU energy supply
- and to have a "fully integrated, interconnected digitalized EU energy market."

CONCLUSION

The energy sector is accountable for a great deal of human-made GHG emissions, representing a high risk for society. Although the economic slowdown caused by the Covid-19 outbreak has contributed in decreasing energy emissions, only structural changes in the O&G industry operations can bring about significant and permanent cuts. Companies are increasingly adopting good governance practices to positively shape their image for investors and the civil society. Investors are more and more conscious about environmental risks, which is also showed by the appreciation of renewable energy and the transition towards debt instruments such as green bonds. From now onwards, with the aid of the most recent technologies, O&G companies shall adopt holistic strategies to increase their level of transparency and accountability, decrease their environmental footprint, and minimize costs to improve their financial margins.

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